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NEW NORTH AMERICAN RECORDS OF THE EUROPEAN BROOM PSYLLID *ARYTAINA GENISTAE* (LATREILLE) (STERNORRHYNCHA: PSYLLIDAE)

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Abstract.—The European psyllid *Arytaina genistae* (Latreille) has been unintentionally introduced into North America, probably with imported nursery stock of its principal host, Scotch broom (*Cytisus scoparius*; Fabaceae). Known previously in North America only from an early twentieth-century collection from Massachusetts and a record of its interception in California in nursery stock originating in Washington State, *A. genistae* is reported from Nova Scotia, Canada, and from North Carolina, Oregon, and Washington in the United States. Morphological characters are provided that allow it to be separated from *Arytainilla spartiophila* (Förster), another European broom psyllid that also is established in eastern and western North America.

Key Words: Insecta, Psyllidae, *Arytaina genistae*, insect distribution, adventive species, Scotch broom

Scotch broom (*Cytisus scoparius* [L.] Link; Fabaceae) is a common northern and western European shrub that has been widely planted and become naturalized beyond its native range. This deciduous, perennial, yellow-flowered legume was planted in Colonial American gardens (Leighton 1976) and was used as an ornamental in California and the Pacific Northwest by the mid-nineteenth century (Clark 1976, Andres and Coombs 1995). It also might have been accidentally introduced into North America with ship ballast (Lindroth 1957). In both eastern and western North America, Scotch broom has been used for erosion control along highways (Hitchcock and Cronquist 1973, Pfeiffer 1986, Dirr 1998). It has been used in the Pacific Northwest for stabilizing coastal sand dunes (Schwendiman 1977). This *r*-adapted shrub (Williams 1981) is considered an invasive plant in western North America and in Australia, Chile, Iran, New Zealand, and South Africa (Syrett et al. 1999).

In Great Britain and continental Europe, a diverse arthropod fauna (>240 species) is associated with Scotch broom (Syrett et al. 1999). Long-term studies of its fauna were conducted at Silwood Park, Berkshire, England, by J.P. Dempster, O.W. Richards, N. Waloff, and their colleagues and students in the 1950s and 1960s (Waloff 1968). Although an Old World lyonetiid moth was introduced into the western United States in the early 1960s to help reduce densities of Scotch broom (Frick 1964, Andres and Coombs 1995), basic studies on the ecology of broom arthropods in England mostly predated the main use of biological control against this plant in areas where it is not native (e.g., Rees and Paynter 1997, Syrett et al. 1999, Fowler et al. 2001).

Among the insects of Scotch broom that

have been accidentally introduced into North America are two species of Psyllidae, the bi- or trivoltine *Arytaina genistae* (Latreille) and the univoltine *Arytainilla spartiophila* (Förster). In North America, *Arytaina genistae* is known only from Massachusetts (Crawford 1911, Hodkinson 1988) and Washington (California Department of Food and Agriculture 1993), whereas *Arytainilla spartiophila* is widely distributed in British Columbia, California, Oregon, and Washington (Waloff 1966, Syrett et al. 1999) and is known in the East from Virginia (Pfeiffer 1986). Herein, we give the first records of *Arytaina genistae* for Canada and the southeastern United States. We also provide morphological characters that allow these adventive psyllids to be recognized in the Nearctic fauna.

Arytaina genistae (Latreille)

The first North American record of *A. genistae* was given by Crawford (1911) in describing the new species *Psyllopa magna* based on T.D.A. Cockerell's collection of a large series of specimens from *Spartinum* [sic] sp. at Woods Hole, Massachusetts. The host plant likely was Scotch broom. *Spartium scoparium* not only is a former name for *C. scoparius* (Peterson and Prasad 1998), but this plant also was recorded from Woods Hole in the early twentieth century as a host for other Old World broom insects (Olsen 1918, Wheeler and Henry 1992). No collection date was given by Crawford (1911), but Cockerell, a professor at the University of Colorado, Boulder, likely collected the psyllid in 1911; that year he spent the summer at the Woods Hole Oceanographic Institution (Weber 1965). Crawford (1914) realized the psyllid from Massachusetts that he had described as new was a previously described European species. He synonymized *P. magna* under *A. genistae* and noted that this adventive species probably had been accidentally introduced into North America with nursery stock.

Records of *A. genistae* from western North America have not appeared in the primary literature. Waloff (1966) did not record it from Scotch broom in British Columbia or California, Hodkinson (1988) listed it only from Massachusetts in his checklist of Nearctic Psyllidae, Syrett et al. (1999) did not include it in a discussion of insects known from broom in North America, and Maw et al. (2000) did not include it in their checklist of Canadian Hemiptera. This psyllid, however, was intercepted in Santa Clara Co., California, on broom shipped from a nursery in Shelton, Washington (California Department of Food and Agriculture 1993; R.J. Gill, personal communication).

New records.—CANADA: Nova Scotia: Shelburne Co., Shelburne, nr. marine terminal, 19 July 1994, 21 ♂, 16 ♀; 7 Aug. 2001, 20 ♂, 16 ♀, ex *Cytisus scoparius*, E.R. Hoebeke & A.G. Wheeler. UNITED STATES: North Carolina: Buncombe Co., jct. U.S. Bus. Rt. 70 & I-40 (exit 55), east edge of Asheville, 4 July 2002, 9 ♂, 6 ♀; 20 July 2002, 3 ♂, 4 ♀, ex *Cytisus scoparius*, A.G. Wheeler; Haywood Co., nr. jct. U.S. Bus. Rt. 23 & SR-1801 (Liner Cove Rd.), 4.5 km NNE of Waynesville, 29 June 2002, 8 ♂, 8 ♀; 4 July 2002, 5 ♂, 6 ♀; 13 July 2002, 5 ♂, 3 ♀, ex *C. scoparius*, A.G.W. Oregon: Marion Co., Aurora, 22 June 1999, 1 ♂, 4 ♀, ex *C. scoparius*, E.R.H. Washington: Clallam Co., nr. Crane, 9 Sept. 1999, 1 ♂, 5 ♀, ex *C. scoparius*, A.G.W. & C.A. Stoops; Jefferson Co., Port Townsend, 9 Sept. 1999, 1 ♂, 4 ♀, ex *C. scoparius*, A.G.W. & C.A.S.; Kitsap Co., Gateway Park, Silverdale, 8 Sept. 1999, 3 ♂, 4 ♀, ex *C. scoparius*, A.G.W. & C.A.S.; Mason Co., Rt. 3, Shelton, 10 July 1999, 2 ♂, ex *C. scoparius*, A.G.W. & C.A.S.; Pierce Co., Purdy, 10 Sept. 1999, 2 ♀, ex *C. scoparius*, A.G.W. & C.A.S.

Voucher specimens have been deposited in the Cornell University Insect Collection (CUIC), Ithaca, NY.

Recognition Features

Arytaina genistae differs in several respects from *Arytainilla spartiophila*, the only other Scotch broom psyllid established

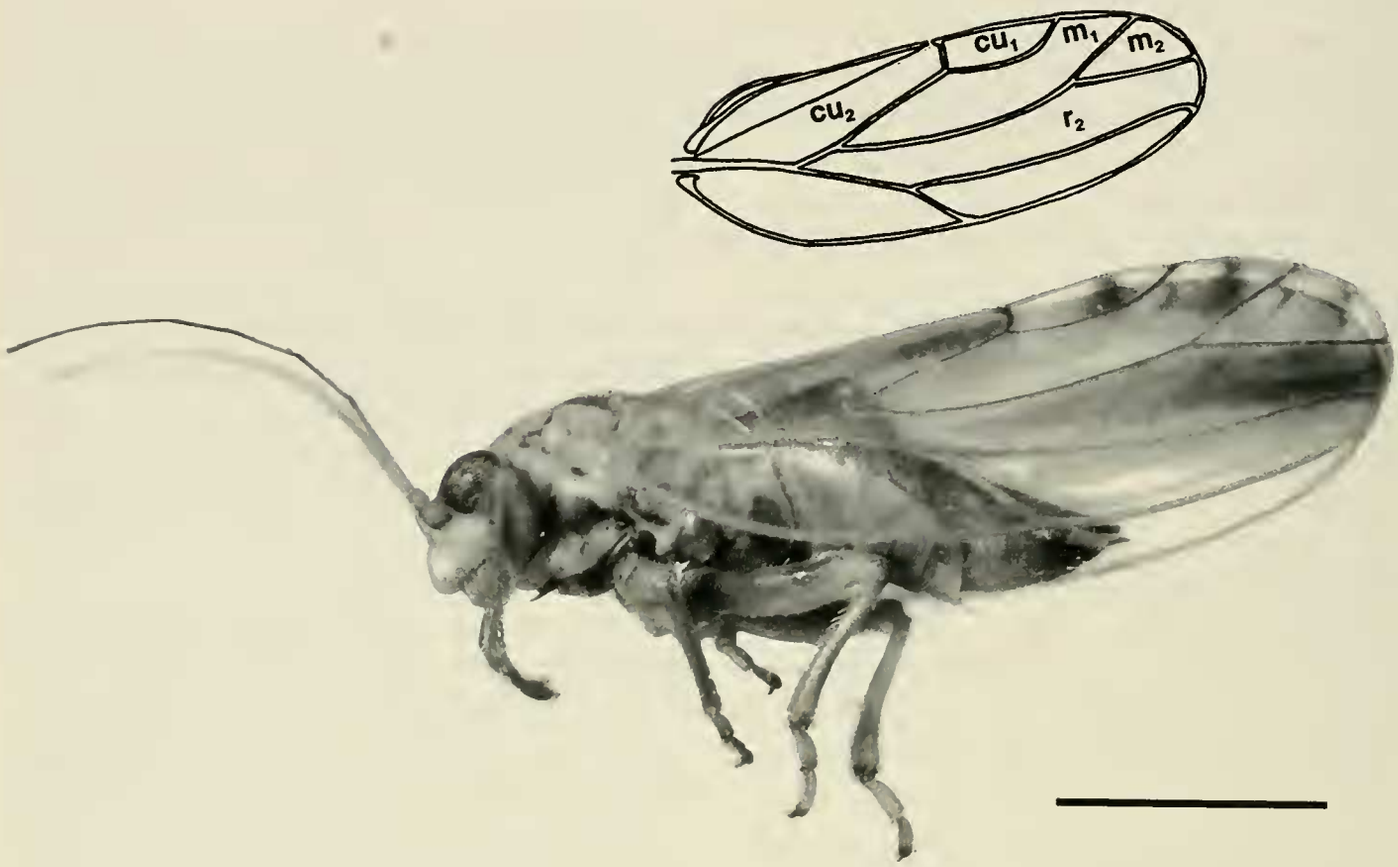

Fig. 1. *Arytaina genistae* adult female, lateral view. Scale line = 1.0 mm. Inset: Forewing with maculated cells identified.

in North America. In *Arytaina genistae,* the forewing is somewhat elliptical, broadest at the middle, with a dark brown to black pattern occupying cells r_2 and cu_2, but also with small patches at the apices of cells m_1, m_2, and cu_1 (Fig. 1) (illustrated by Hodkinson and White 1979: 38, fig. 109; Ossiannilsson 1992: 95, fig. 406). In contrast, the forewing of *Arytainilla spartiophila* is oblong-oval, broadest at the apical third, and entirely pale yellow throughout (Pfeiffer 1986: 215, fig. 1). The male and female terminalia of each species also are distinct, as illustrated by Hodkinson and White (1979) and Ossiannilsson (1992).

Discussion

More specialist insect species are found on Scotch broom in the Pacific Northwest of North America than in any other region where this plant is adventive (Syrett et al. 1999). Most broom herbivores accidentally introduced into the Pacific Northwest and other regions either overwinter as eggs embedded in year-old twigs or as larvae under the bark of host shoots (Waloff 1966). *Arytainilla spartiophylla,* which overwinters in the egg stage and inserts its eggs into host shoots (Waloff 1968, Watmough 1968), fits the life-history pattern of most other introduced broom insects. In contrast, *Arytaina genistae* deposits its eggs superficially on leaves and other plant parts, and the adults overwinter on the host plant (Waloff 1968, Watmough 1968). It, therefore, might not have been predicted to be introduced with nursery stock and to become established in North America. Yet records of *A. genistae* from both the east and west coasts suggest multiple introductions from Europe. Alternatively, a single introduction and subsequent movement in North America with shipments of broom nursery stock could have resulted in the currently known distribution of this psyllid.

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